

HEALTH

A WEEKLY JOURNAL OF
DOMESTIC AND SANITARY SCIENCE.

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Lie in three words, HEALTH, PEACE, and COMPETENCE."—Pope.

EDITED BY DR. ANDREW WILSON, F.R.S.E. &C.

VOL. XII.—No. 288.

FRIDAY, OCTOBER 12, 1888.

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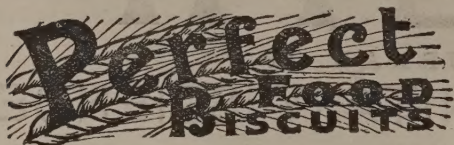
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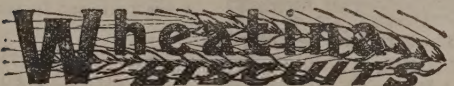


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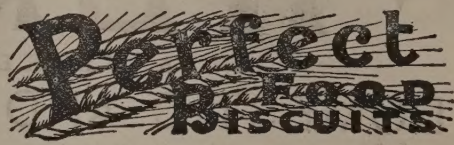
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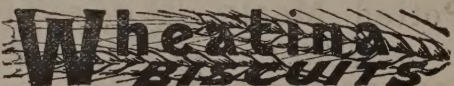


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♦ HEALTH ♦

EDITED BY

DR. ANDREW WILSON, F.R.S.E., &c.

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Notes by the Way

BY THE EDITOR.

"Health is the foundation of all our physical happiness."—Herder.

REGARDING the action of pepper and mustard on digestion, mustard, in doses of from two or four drachms daily, is said by a foreign *savant* to be without effect on the assimilation of nitrogenous substances or "flesh foods." Pepper, in doses of from eight to sixteen grains, delays digestion from 0.4 to 2.3 per cent. In doses of from one to three drachms daily, mustard delays the assimilation of fatty matters 2.2 per cent. It stimulates the appetite, whereas pepper diminishes it. Mustard is said to have no effect on the secretion of urine, but pepper augments it from 3 to 14 per cent. Both, however, act as irritants on the stomach and intestines.

A CORRESPONDENT inquires for a remedy for sore and swollen feet. In reply to him I may say that persons whose occupation keeps them on their feet a great deal, often are troubled with chafed, sore, and blistered feet, especially in extremely hot weather, no matter how comfortably their shoes may fit. A powder is used in the German army for sifting into the shoes and stockings of the foot soldiers, called "Fusstreupulver," and consists of eight parts salicylic acid, ten parts starch, and eighty-seven parts pulverized soapstone. It keeps the

feet dry, prevents chafing, and rapidly heals sore spots. Finely pulverized soapstone alone is very good. Woolley's Sanitary Rose Powder, or Hutton's Foot Powder will also be found highly useful in such cases.

I SHOULD be the last person in the world to object to what has been called "medical journalism for the public"—by that name meaning the instruction of the public in health-matters, and in all details relating to the prevention of disease, to the knowledge of the body's structure and functions, and to the use of simple remedies in ordinary and simple ailments. But I am constrained to enter a strong personal protest against the purely medical details contained in a recent number of a contemporary journal, which, among other multifarious and diverse aims, professes to convey health-instruction to the people. A copy of this journal lies before me, and publishes, under the title of sick-room hints, details which I make bold to say should not have been allowed to appear in the pages of a print ostensibly intended for family and general perusal.

IN one page, I find a portion of a serial story, in another a "Children's Corner," while in another page, to which I have just alluded, are contained matters which I have never seen outside the covers of a nurse's manual, or of a midwifery or other medical textbook. Surely the conductor of the journal in question might distinguish between ordinary sick-room hints suitable for the public, and those intended for medical men and nurses alone. That his newspaper is not intended to appeal to nurses only is evident from the miscellaneous character of its pages. Facts of medical kind, printed thus boldly in a lay periodical, simply minister to prurient curiosity. I protest strongly against the placing of such medical details before the public, especially as their uselessness, in so far as the public are concerned, is plainly apparent. It is editorial indiscretion of this kind which is apt to discredit the journalism that, worthily carried on, serves the high purpose of promoting health and preventing disease.

MEDICATED biscuits, says a contemporary, are often used on the Continent, especially for children, and the usual way is to give to a pastry-baker the medicines in the shape of powder, to be mixed with the biscuit paste and divided into a given number of cakes. As an accurate division is thus seldom secured, M. A. Xanthopoulos, of Makri-Keni (Turkey), has proposed the following process to be executed by the pharmacist himself. Take the medicine prescribed, mix it with four times its weight

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of powdered sugar, and divide into the requisite number of doses. Now with a brush spread each powder on the spongy side of a well-baked biscuit, and finally apply over it a coat of thin mucilage. After drying in a warm place the cakes may be dispensed. To give a better finish a little powdered starch and sugar may be dusted over the medicated side before the mucilage is quite dry. M. Xanthopoulos recommends the process as a quick and convenient one, affording all the accuracy necessary in the exhibition of medicines.

◆ ◆ ◆

THE Italian Government, I observe, has recently caused to be carried out a number of experiments with a view to testing the comparative merits of castor oil and olive oil for lubricating purposes on board ship. From the results obtained they have given orders that henceforth all exposed parts of machinery are to be lubricated exclusively with castor oil, while mineral oils are to be used for cylinder and similar lubrication.

◆ ◆ ◆

AFTER exhausting doubtful cases in France, old persons above 95 prove to be really 83 in number, 52 of whom are women. The ages of 118 and 114 were claimed respectively by two of them; but as the first, a woman, and the second, a Spaniard, could show no exact documents, 105 may be set down as the extreme limit of life in France. As to the social status, beggars, 22 in number, form the majority, only one, Chevreul, the great chemist, being really wealthy, a fact suggesting the query whether mendicancy promotes old age or old age mendicancy.

◆ ◆ ◆

IN connection with crimes of mysterious nature, the following case of suicide, which recently occurred in Jamaica, presents features of considerable interest and no little importance. A coloured man, after murdering his sweetheart, entered his house, and cut his throat with a razor. Some of the neighbours who had witnessed both deeds rushed into the house, but were unable to find him. After a search his dead body was found under the house, which was a small one, built on supports, raising it about two feet from the ground. After cutting his throat, the man must have walked or run to the back entrance, a distance of sixteen feet, and then have crept through a hole in the partition, and have crawled on all-fours to the spot where his body was found, exactly beneath the room where he cut his throat, and therefore a further distance of sixteen feet.

◆ ◆ ◆

THE throat was cut from ear to ear by a clean sweep, both carotids and jugulars being severed, as well as the trachea and œsophagus, the wound reaching back to the anterior portions of the bodies of the vertebræ or neck-bones. A blood-stained razor, which was deeply notched, was found in the room, and marks of blood were traced from the room to the back entrance, by which the man must have gone out. Remarkable instances of the retention of voluntary power after wounds of the carotid artery have been occasionally recorded; but a medical journal, in commenting on the case, says that it knows of no occasion on which the vessels on both sides of the neck were divided, where so much power was retained by the subject of the injuries as in the present instance. The case should serve as a perpetual warning to medical men not to be too dogmatic as to what is, and what is not, possible, even in the presence of the most rapidly fatal wound. Cases have also been recorded in which, after serious and presumably fatal injury to the heart, persons have been able to move, or even walk, for a considerable distance.

Original Essays

"Life is not to live, but to be well."—*Martial*.

THE CHEMISTRY OF THE HOUSE.

By DR. DRINKWATER, F.C.S., &c.

Lecturer on Chemistry in the Edinburgh Medical School, &c.

SECOND PAPER.

A GLASS OF WATER.

WATER is the most abundant substance on this globe, and certainly one of the most useful and, I may add, one that we value the least. Nature gives us in most localities a plentiful and pure supply, and man, with his usual ingenuity, pollutes it.

The importance of water in the economy of this globe may be realized when we learn how much is contained in a few common objects. Potatoes contain eighty per cent., turnips ninety-three per cent., whilst man himself is composed mainly of water. A man of average weight, say twelve stones, would contain nine stones of water. As regards its chemical composition, pure water is made up of two gases—oxygen and hydrogen—chemically united together. This fact can be proved in many ways. In the first place, if we pass a powerful electric current through water it is decomposed into these two gases. The blacksmith in carrying on his daily employment is constantly, though unknown to himself, performing an experiment which proves it. When the smith is forging a piece of iron, he dips the hot metal into water to cool it, the result being that the oxygen of the water clings to the iron, and forms the black scales which so readily peel off, and the hydrogen escapes in bubbles. Then—perhaps the most convincing proof—Cavendish, the great chemist, performed the synthesis of water by mixing the two gases together in proper proportion, viz., two volumes of hydrogen and one volume of oxygen, causing them to combine chemically—and water was the result.

So far we have been discussing pure water; but in a general way we have very little to do with such a rarity. Water, as we use it, always contains certain impurities: some harmless, others deleterious. The best way to learn the origin of these impurities is to trace a supply from its source.

We will commence at the ocean. A mass of water, impure from the presence of common salt and other substances dissolved in it. The heat of the sun causes this water to evaporate and rise into the air as moisture, and the moisture-laden air, being wafted to a colder climate, deposits its water as rain. The water in evaporating leaves its solid impurities behind, so that we have here the nearest approach to pure water in nature. The chemist takes advantage of this, and imitates nature in producing pure or distilled water for use in the chemical laboratory. He condenses the steam of ordinary water by cooling it, and thus procures a water practically free from solid matter. The water in the clouds, then, we can look upon as pure water; but as soon as it descends as rain it begins to gather impurities. Our atmosphere, unfortunately, contains some gaseous matters which are very soluble in water, and as the rain descends it removes these substances—reaching the earth with carbonic acid and ammonia dissolved in it. The former of these plays a very important part in the future history of the water. The rain now sinks into the ground, and perhaps passes through some limestone

rock, and it ultimately reaches the surface again in the form of a spring.

The rain water and the spring water are very different in their properties, and these differences are most marked, even to the inexperienced. A housewife would tell us that the rain water was soft, but that the spring water was hard. Here are two terms which, though of common use, need some explanation. If we wash our hands in the soft water the soap immediately forms a lather, but in the hard water we notice little curdy flakes forming as we rub the soap in the water, and some little time elapses before we produce a lather—each little flake representing so much soap rendered insoluble and useless. The following is an experiment any one can try: Pour a little rain water into an iron spoon—such a one as we have for kitchen use will do. Heat this over a gas flame until the water is boiled away, and it will be noticed that no residue is left. But in treating some spring water in the same manner a greyish white deposit will be left in the spoon representing the solid matter dissolved in the water. We may reasonably conclude from these simple experiments that the solid matter dissolved in a water plays an important part in determining its properties.

The two following analyses of the solid matter dissolved in water will show the differences:—

	Hard Water.	Soft Water.
Carbonate of lime	13·31	1·98
Carbonate of magnesia	3·02	·62
Sulphate of lime	2·08	1·3
Chloride of magnesia	1·10	—
Chloride of sodium	2·64	2·13
Silica	·49	·41
Total grains per gallon	22·64	6·44

If we now pursue our investigations a little further, we shall find that some hard waters become soft on boiling, others remain almost unchanged. The water which has softened, however, is no longer clear, but contains small particles suspended, which ultimately settle down to the bottom of the containing vessel. This substance is found by chemical analysis to be carbonate of lime, and sometimes carbonate of magnesia also. So that we may reasonably conclude that these substances, dissolved in water, make it hard. And still further, that this peculiar form of hardness is removable by boiling. It is therefore described as *removable hardness*, to distinguish it from the other form called *permanent hardness*—because it cannot be removed by boiling. This modification is due to sulphate of lime.

Carbonate of lime will be better known to most of my readers by its more common name *chalk*, and it is at first difficult to understand how such a compound can be dissolved in water. Try the experiment of shaking up chalk and water, and you will find that the milky fluid which results will become quite clear on standing—all the chalk settling down, and leaving the clear water unchanged above. If, then, chalk is insoluble in water, how does it get into spring water?

You will remember that one of the impurities which the rain dissolved from air was carbonic acid gas. Now, it is this gas which enables the water to dissolve the chalk; for although chalk is insoluble in pure water, it is soluble in water containing carbonic acid, and if we boil such a water, we drive off the carbonic acid, and the chalk—no longer soluble—is thrown down as a white or grey powder. The so-called *fur* on the tea-kettle is simply chalk deposited from the water, which has been deprived of its carbonic acid by boiling.

How about the sulphate of lime, which we have seen is the cause of the permanent hardness? We must seek for another explanation here, for sulphate of lime, or

plaster of Paris—to call it by a better-known name—is almost as difficult to dissolve in water as chalk, and the difficulty is not in any way lessened by carbonic acid—in fact, carbonic acid has little or no effect on the solubility of sulphate of lime. If we trace permanently hard waters to their source we find they mostly are derived from deep wells, and we therefore conclude that the pressure to which these waters are subjected in their course through the earth causes the water to dissolve this substance.

Besides the solid matters mentioned in the two analyses alluded to, there are other substances, which are usually somewhat vaguely described as organic, which form an important factor in determining the sanitary value of a water.

The two following analyses, made for sanitary purposes, will illustrate the differences between good and bad water:—

	Grains per gallon.	
	No. 1.	No. 2.
Total solid matter	32·1	12·3
Volatile matter	5·0	·9
Chlorine	10·6	2·2
Nitrogen as nitrates and nitrites	·9	·04
Saline ammonia	·31	·001
Albumenoid ammonia	·08	·004

No. 1 was condemned; No. 2 was passed as a wholesome water.

It will be seen that the most striking differences are in the relative qualities of saline and albumenoid, ammonia, chlorine, and nitrogen. These substances indicate directly or indirectly the amount of pollution. Ammonia is a product of the decay of both animal and vegetable matter. The albumenoid ammonia is supposed to show the amount of organic matter, as it is only derived from it. Chlorine, chiefly existing as common salt, is contained in all the excretions of the body, and the nitrogen, existing as acids, is the product of the oxidation of organic matter. In fact, the conversion of organic matter into these two nitrogen acids is nature's method of rendering it harmless. So that although nitrates and nitrites in themselves are perfectly harmless, they show that the water at one time has been polluted, but that by nature's oxidation process it has been purified, and the only danger to be feared is that by some means not under our control nature's efforts may be nullified, and the water become impure and dangerous again. What is the exact nature of the organic poison of water we cannot at present say, but this we do know, that it is potent; and no fact brings this to our mind more vividly than the way in which it acts through milk. The mere washing of a milk-can with polluted water has more than once caused an outbreak of zymotic disease amongst the consumers of the milk.

Having pure water supplied to our houses, one would imagine we would do our best to keep it pure, but in the majority of cases it is not so. Some do not care to trouble themselves about such things, others almost appear to go out of their way to pollute the water-supply; and whilst the wonderful combination of cistern and w.c. that builders place in most modern houses is allowed to pass unchallenged, it is an impossibility to prevent it. The water cistern may be a convenience, but unless it is properly placed and carefully looked after, it is a most fruitful source of disease. Any out-of-the-way corner will do for a cistern—so the builder thinks; a cover seems to be an unnecessary piece of extravagance. If there be no other place left, it can be placed over a w.c., and the waste pipe can be run into the soil pipe—a wonderful provision of the plumber to cause disease.

We should remember that a cistern is not self-cleansing, and that no matter how carefully it is covered up, dust and dirt accumulate on its sides, and will sooner or later pollute the water. A cistern needs cleansing *at least* once in six months, and the cleansing operation should be so performed that whilst all sediment and slime is removed the metal lining is not scraped or burnished, otherwise there is a danger of lead poisoning. A soft brush or cloth will easily remove the conglomerate of dirt, and not abraid the surface of the lead.

I have often been asked for a simple test for a bad water—one that an unskilled person could apply—and am sorry when I have to reply there is no such thing as yet discovered. Water analysis itself is one of the most delicate processes of the chemist, and when done it requires a considerable amount of experience and skill to form an opinion from the results. Prevention is better than cure; and if a good water is sent to your cistern take care to keep it good. It is surprising to see the things turned out of a cistern even after six months: dead insects, and even a dead and partially decomposed mouse, I have seen in one case. What nice reflections the consumers of that water must have had when they thought of the liquid they had quenched their thirst with. If it had not been for illness, the body of the mouse might have remained undisturbed for a considerable time.

Having examined the composition of water, let us now see how much we require to keep us in health. Physiologists tell us that a man of average size needs daily five pints. A portion of this will, of course, be taken into the body with the food—*i.e.*, water contained in vegetables, bread, &c. The remainder, amounting to three and a half pints, is taken in some form of liquid—such as soup, tea, coffee, or beer, &c. As to the use of water in these beverages, we shall speak further on.

If the solid matter in a water is in very large quantity it is then classed as a mineral water, and the most prominent salt dissolved gives it a special character and name. If iron salts are present, it is a chalybeate water. If sulphur compounds, an hepatic water, a sulphur well; if sulphate of magnesia (Epsom Salts) or sulphate of soda (Glauber's Salts), then the water is an aperient water. A large number of mineral springs are scattered over our land, and are resorted to by invalids. These waters derive their salts from the rocks through which the water passes in its way to the surface, and are, of course, unfit for ordinary consumption—in fact, should not be taken at all unless under the direction of a medical man.

This is as much as we can learn just now about our glass of water. We shall have to return to the matter when treating of chemistry in the kitchen.

WORM-KILLERS, EYE-OPENERS, WHIPS, &c.—The question of diminishing the consumption of spirits in Belgium is being seriously discussed. A newspaper published in a poor part of Flanders states that the daily consumption of a working man—not a drunkard—there includes at 5.30 a.m. a "worm-killer," at 8 a.m. an "eye-opener," at 11 a.m. a "whip," at 2 p.m. a "digester," at 5 p.m. a "soldier," and at 7.30 p.m. a "finisher." His regular yearly expenditure for drams, without counting extra libations on festive occasions, amounts to 219 fr.—a rather important item in a family budget of from 800 fr. to 1,200 fr. a year.

SOLDIERS' RATIONS.

By DR. W. CURRAN.

(Concluded.)

This defective quality of his meat is not, after all, the point, though it very closely bears on it, and I therefore recur at once in this connection to the following memorandum, which a very intelligent non-commissioned officer of my acquaintance has just handed me. It speaks for itself, and far better than I could speak for it; and its accuracy and pertinence to our issue admit of no question.

SOLDIERS' RATIONS.

Government only supplies to each man 1 lb. of commissariat bread. $\frac{3}{4}$ lb. of meat (bone included).

A deduction of 2½d. per diem is made daily from each soldier for the undermentioned articles, viz.: Coffee, tea, sugar, milk, salt, pepper, mustard; $\frac{1}{4}$ lb. bread for tea; potatoes, green vegetable.

He purchases black lead to clean the trestles, fireplace, &c., also soap for the forms and tables.

Each mess pays for its own basins and plates to eat their food out of.

A corporal is in charge of every mess, and he daily purchases the articles named, inserts the number of men in mess every day, and deducts the total amount of expenditure from the amount of men at 2½d., carrying the Dr. or Cr. forward to the following day. Should there be any credit at any time, it is expended in purchasing ingredients for a pudding—commonly termed "duff"—or extra butter or vegetables.

The food is invariably good, and *sufficient*—after a soldier has become accustomed to his change of irregular to regular habits. A recruit is always hungry, but after a time has generally something left in the way of a piece of meat and bread from dinner, which he eats for supper.

The bread is served in 2-lb. loaves, but *not weighed* before issue.

The meat is made into the following dishes:—

Roast.

Boil (the liquor making soup; but all vegetables—pearl barley, peas, &c.—the soldier finds himself); Coomassie stew.

Bake: Meat pie (pastry ingredients purchased by soldier).

If a soldier receives what he is supposed to have, it is sufficient for anyone, and the way to prevent dishonest quarter-master sergeants, quarter-masters, and butchers from giving short weight to the messes is: To allow *only* the orderly officer for the day to place the weights (which should be often tested) on the scales, each weight bearing distinctly its value, and the ration indents should be in his charge—he calling out the number of mess and the amount of meat, &c., required. The quarter-master sergeant should only be present to see that the meat, &c., passes the inspection of the orderly corporals.

No one except cooks and orderly men should be allowed in the cook-house, nor married women on any pretence whatever.

The butcher should not be allowed to place his finger on the scale, and all meat placed in the middle, not at the side, of a scale, for at the side it weighs less.

As a remedy for this state of things, I would recommend that three picked men from each company should be allowed—nay, ordered—to attend daily at the ration-stand; and that they should weigh themselves, or see weighed before them, under proper sanction, such portions of the ration as they should elect. For it must be remembered that the soldier is scarcely represented at all at this meeting. He is ignored, in short; and yet he is the unit, the person, that calls (for the reasons already given) for the consideration of the ratepayer, and the indulgence and support of his superiors.

A soldier's pay, after all deductions are made, stands thus:—

Amount of Pay and Deductions.	Dr.		Cr.	
	£	s. d.	£	s. d.
To 31 days' Pay at 1s.			1	11 0
Compulsory Payment Monthly:—				
By 31 days. Messing at 2½d.	7	3½		
By " Washing at ½d.	2	1½		
Library 2d., Hair-cutting 1d.		3		
Barrack Damages (say)		4		
Tailor's Bill (say)		6		
Shoemaker's Bill (say)		9		
31 days' clear money at 7½d.	19	9		
	£1	11 0	£1	11 0

This statement tells its own tale so well and so truthfully as to call for little comment and no criticism at my hands. Omitting for the nonce the word invariably, as not being applicable, I accept my informant's statement to the full that "the food is good and *sufficient* after a soldier has become accustomed to his change from irregular to regular habits. A recruit is always hungry, but after a time has generally something left in the way of a piece of meat and bread from dinner, which he eats for supper;" but all the same the food is very monotonous, and not so well cooked as it might be. I think it would be greatly improved by the *alternate* weekly or bi-weekly addition—at the option of the men—of a meal of pork or fat bacon, or as at Gibraltar and some other foreign stations, fish.* Such fish as cod, hake, ling, &c., in their seasons, contain, as all chemists know, sufficient support as well as diversity for ordinary mortals. Whole peoples, as we all know, live healthily on these products of the sea, and they are generally easily procured. They would add little or nothing to the burthens of the State; and I protest, as a householder, a physician, and a taxpayer, to throwing good money after bad. I would also keep the married peoples' fingers out of the pie, and see that the soldier got the value of his money at the ration-stand, in the canteen, and also in the cook-house. For as an old poet has said:

"In little trades more tricks and lying
Are found in selling than in buying;
But in the great, unjust dealing
Is found in buying than in selling;"

and no one can deny the greatness, as well as the costliness, of the traffic here referred to.

But to conclude this long, and, I fear, too discursive dissertation, I have, speaking for myself alone, ever held that the present is—subject to the conditions indicated above—except possibly for the first year or two of the soldier's life, a fair ration. We must not forget, in the interests of an already overburthened public, that our little army is, of its kind, and for its numbers, the costliest in the world. Why this is so is not now the question, but I could, I think, "an I would," show where the shoe pinches; and I could, "an I would," relieve this tension by beginning at the head or in the top, rather than, as *is now too frequently the fashion*, at the bottom, or rather in the lower grades. The money of the public is, in short, frittered away, in my opinion, on establishments and staffs that are either excessive or that are not needed at all. But this is a question for others rather than for me. As to the dietary of the foreign soldier, here are a few items about it which may interest the curious reader. I can find little or nothing on this subject in Dr. Parkes' book, or, with the exception of Dr. Davy, in any other work in my little collection.

Discussing the point in his "Sea-Board Slave States," the late Mr. Olmsted says that "the United States army is generally recruited from our labouring classes, and a well-conditioned and respectable labourer is seldom induced to join it." The following, taken from an advertisement for recruits in the *Richmond Enquirer*, shows the food provided: "Daily Rations, one and a quarter pounds of beef, one and three-sixteenths pounds of bread; and at the rate of eight quarts of beans, eight pounds of sugar, four pounds of coffee, two quarts of salt, four pounds of candles, and four pounds of soap, to every hundred rations." This would appear to be, on the whole, a more liberal diet than ours.

And to show the necessity for change and variation of dietaries, I will quote the two following. Alluding to the conditions of sailor-service under the Tudors, and especially so under Elizabeth, Froude says that "the sailors' allowance in 1585, for every flesh day . . . was a pound of biscuit or a pound and a half of bread, a gallon of beer, and two pounds of meat—salt beef or fresh beef and mutton, as the case might be. On the three other days he has the same quantity of beer and biscuit, with half a 'ling or cod' (as recommended within) and half a pound of butter or a pound of cheese. The diet was occasionally varied by *substituting bacon for beef and mutton*, reducing the salt fish and increasing the butter and cheese; in all cases, however, the beer and bread remaining the same. These allowances were," he adds, "never altered whatever might be the variation of price." The italics are mine. I used them in order to emphasize my recommendations for change and variety, and also because this statement seems to show that in spite of her parsimony, Elizabeth placed then a greater value on her sailors than we do now on our soldiers.

In further illustration of these points, he adds in a note to the above, that "the Spaniards, still more aware of the importance of change of diet at sea, varied the rations more frequently. A pound and a half of bread and a pint of Andalusian wine were allowed daily. Meat, fish, and cheese, alternated in rather smaller quantities than in England, but with the addition of peas, beans, and garlic made into soup;" and a very good soup too. The whole arrangement shows that they knew the value of change and variety, and shows also that in these respects they were far ahead of us.

Again, and just to show that even our Workhouses and Colonial authorities are ahead of us in these respects, I subjoin the two following items, and leave them to tell their own tale. The subjoined extract is from a late issue of the *Standard*, and those who read my little paper on Workhouses in these pages, need no further introduction to it from me. Here it is; I will only add that when I was in charge, years ago, of the Convict Hulk at Gibraltar, I came to the conclusion that the convicts it contained had better cooking and better grub than our soldiers hard by:—

"Males.—Breakfast at 7.30: Six ounces of bread, half-ounce of butter, one pint of tea or coffee alternately, with milk and sugar. Dinner at 12: Six ounces of meat, cooked and free from bone (legs of mutton on Sundays), twelve ounces of potatoes (six ounces of meat, cooked and free from bone, is equal, after allowing for waste, to twelve ounces raw meat with bone). Supper at 6: Six ounces of bread and half-ounce of butter, and one pint of tea, with milk and sugar. In all, thirty ounces of solid food daily."

This speaks for itself. I will close the series with an extract that relates to the German soldier's diet and cookery. Describing the Polynesian coolie-labourer in Queensland, the late Mr. A. Trollope says ("Australia and New Zealand," Vol. I., p. 137), that the food provided for him by Act of Parliament is as per this scale—

RATION.

Beef or mutton, 1 lb. daily.
Vegetables (or rice, 4 oz.), 2 lbs., or maize meal, 8 oz.;
Tobacco, one and a half ounces weekly.
Salt, two ounces.
Soap, four ounces.

* I have known more than one officer in my day who voluntarily, and without any religious concernment or obligation, substituted fish on one day of the week for meat. A good substitute too, say I.

CLOTHING.

Shirts, two yearly.

Trousers, two.

Hat, one.

Blankets (a pair), one.

As to the following, which relates to German cookery and military dietetics, it also plainly tells its own story; and my object in introducing it here is again to call attention to our soldier cookery, and express my views as to its shortcomings on all whom it may concern. It is in my opinion far from perfect, but it may supply a hint towards future improvement:—

"Cooking for the Soldier in Germany.—Alluding to some experiments in this direction, recently made in Germany, the *Pall Mall Gazette* of Nov. 8th, 1878, says, in an occasional note: 'On Sunday the dinner consisted of broth, roast beef, and potatoes, with onion sauce. On Monday the morning meal consisted of thickened soup; the dinner of peas, potatoes, and pork. On Tuesday the morning meal was of semolina broth; the dinner of oatmeal gruel, beef, potatoes, and cabbages. On Wednesday the morning meal consisted again of thickened soup; the dinner of vegetable soup, meal, potatoes, and beans. On Thursday the morning meal consisted of semolina broth; the dinner of rice broth, beef, and fried potatoes. On Friday the morning meal was of thickened soup; the dinner of peas, potatoes, and fried bacon; and on Saturday the first meal was of semolina broth; and the dinner of oatmeal gruel, beef, potatoes, and cabbage.'"

FRENCH GLUTEN-BREAD FOR DIABETES.—This is the bread which many Continental practitioners prescribe in cases of diabetes, and it is characterized by a paucity of starch, which is the chief ingredient of our ordinary loaves. This kind of regimen was formerly recommended by the late Prof. Bouchardat, of the Paris School of Pharmacy, and in the eyes of many modern physicians it is erroneous, the more so as the patients often manifest a great dislike to it, and recourse has to be had for a time to ordinary bread. Latterly, however, a better kind of gluten-bread has been made; it resembles ordinary bread in its general aspect, and is not unlike in taste certain kinds of cakes which are readily eaten by most people. Moreover, it is easily masticated. The formula from which this new gluten-bread is made is set down thus: Best quality of yeast, 20 grammes; cold water, 120 grammes; butter, 125 grammes; gluten-flour, 500 grammes; and eggs, 4. For one loaf. The yeast is stirred carefully and quietly into the water, then the eggs and butter are added, and the whole melted. The gluten-flour is mixed in and worked up with these ingredients, and a round loaf is thus made which is about 18 inches wide and 20 inches deep; it is placed before the fire for about an hour to cause the dough to rise, and is baked in an oven heated from below. Gluten-flour is manufactured expressly for this and other kinds of cakes. We are assured that the above is an improvement on the old kind of gluten-bread which gave practitioners so much annoyance, as many patients could not eat it, and complained of its feeling like so much parchment in the mouth.

DISEASES OF THE NOSE, with Chapters on Ozena, Impure Breath, Polypus, and Malformation of the Nose, and Analysis of Cases treated by a new method. By LITTON FORBES, M.D., Senior Surgeon to the Eye and Ear Hospital, 67, Wells-street, London, W.—HENRY RENSHAW, 356, Strand, W. Price 13d. —[ADVT.]

Personal Health

"Be timely wise;
With health all taste of pleasure flies."—Gay.

REMEDIES FOR RHEUMATISM.

THE cold, damp days of autumn will soon point out to those predisposed to gout and rheumatism the frailties of their organisms. A *résumé* here of all the drugs prescribed for rheumatic troubles is obviously quite out of the question, though a few may be mentioned with advantage.

PINE BATHS.

The popularity of pine baths in Great Britain is nothing like what it is on the Continent, where thousands repair to the hydropathic institutions for them. The results of treatment are excellent. But as it is not possible for all to go to Reichenholl, for example, we give directions for the taking of pine baths in one's own home.

Empty a bottle of Pumilis Pine Extract into an ordinary bath filled with water to any temperature desired. Half a bottle is sufficient for a child's bath. The best time for a hot pine bath is before going to bed.

The essential volatile principles of the Pumilis Pine render baths medicated with the Extract of the very greatest utility.

ANTIPYRIN.

Of course the salicylates have for some years been recorded as unequalled for rheumatism, though the tendency to relapses with them was fully recognized. Antipyrin, which has now been in use for some years, is proved to possess certain advantages over all other anti-rheumatic remedies. It relieves the pain at once. It lowers the fever more certainly than anything else. It reduces the swelling. Moreover, it is applicable to acute, subacute, and chronic cases.

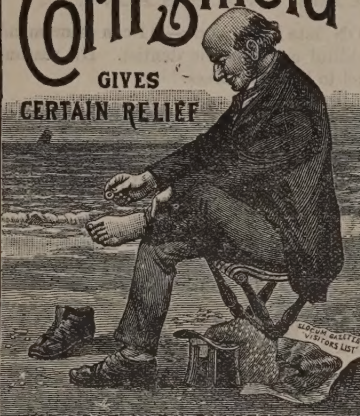
"In no form of febrile disease," says Bartholow, "has Antipyrin been so efficient as in acute rheumatism, and here it maintains the first place as a remedy. In acute rheumatism it is superior to salicylates and to other remedies. From fifteen to twenty grains (three or four tabloids), every three to six hours, will be required until the cessation of joint pain, and the disappearance of the swelling." As is the case with other drugs, some care is requisite subsequently to guard against a relapse, "and hence persistence is necessary in the use of the remedy for some days after the attack has apparently ceased, but the amount given should be slowly reduced."

SALOL.

Remedies do not act precisely alike in all cases, and if any have tried antipyrin in vain, they have a most important resource in Salol. "The first triumphs of Salol," writes an eminent authority, "were more in the treatment of *acute rheumatism*, excelling, as it apparently does, all other remedies in its power to abate pain and lessen fever. If all the conditions be propitious, by the end of the second or third day fever and joint-pain and swelling will have disappeared." It should be continued subsequently. Its control over pain is marked, especially in "that large and determinate class called *rheumatic*, of which lumbago, sciatica, and neuralgia are representatives. The dose is one or two five-grain tabloids three or four times a day," given under medical direction.

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One can easily prepare and place it in the cavity of the Tooth in a soft state, and in a few hours it becomes a perfectly hard and white Enamel, forming as it were a part of the original substance of the Tooth.

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Thomson's COD LIVER OIL CREAM.

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London Agents: SANGER & SONS, 489, Oxford-st.

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THE Throat and Windpipe are especially liable to Inflammation, causing soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use

EPPS'S GLYCERINE JUJUBES.

In contact with the glands at the moment they are excited by the act of sucking, the glycerine in the agreeable confections becomes actively healing.

Only in boxes, 7½d., and tins, 1s. 1½d., labelled—

JAMES EPPS & CO., Homœopathic Chemists.

A WONDERFUL MEDICINE. BEECHAM'S PILLS



ARE universally admitted to be worth a Guinea a Box for Bilious and Nervous Disorders, such as Wind and Pain in the Stomach, Sick Headache, Giddiness, Fullness and Swelling after Meals, Dizziness and Drowsiness, Cold Chills, Flushings of Heat, Loss of Appetite, Shortness of Breath, Costiveness, Scurvy and Blotches on the Skin, Disturbed Sleep, Frightful Dreams, and all

Nervous and Trembling Sensations, &c. The first dose will give relief in twenty minutes.

Every sufferer is earnestly invited to try one box of these Pills and they will be acknowledged to be

WORTH A GUINEA A BOX.

For females of all ages these Pills are invaluable, as a few doses of them carry off all humours, and ring about all that is required. No female should be without them. There is no medicine to be found equal to Beecham's Pills for removing any obstruction or irregularity of the system. If taken according to the directions given with each box they will soon restore females of all ages to sound and robust health. This has been proved by thousands who have tried them, and found the benefits which are ensured by their use.

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Quickly correct all irregularities and relieve the distressing symptoms so prevalent with the sex. Boxes, 1s. 1½d. and 2s. 9d., of all Chemists. Sent anywhere for 15 or 34 stamps, by

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THE TEMPERATURE OF OUR FOOD AND DRINKS.

Of all nations, the American is most in the habit of taking his food and drink at a temperature as remote as possible from that of the body. Ice-water drinking is a national habit, and ice cream is a national dish, predilection for which runs through all classes of society, and becomes a binding force in social and, we might add, scientific and religious gatherings. Americans should, therefore, take an interest in the experimental researches on the temperature of our food and drink made by certain foreign *savants*, whose names are, as is usual, sprinkled with consonants just in proportion to the rigidity of their science and the seriousness of their inquiries.

The temperature of our food and drinks was treated of by Von Spath and Kostjurin a year ago, and more recently by Uffelmann, of Rostock.

Professor Uffelmann reviews the work of his predecessors, and draws his conclusions partly from this and partly from his own experiments. They bear first upon the temperature of ingesta in health, and the rules laid down are :—

1. That, in general, a temperature of food and drink which approaches that of the blood is most healthful. For nurslings such temperature is essential.

2. For quenching the thirst, the best temperature is from 50 degs. F. to 68 degs. F. The favourite American temperature is, as is well known, 32 degs. F., and an issue is raised at once between Professor Uffelmann and the American nation.

3. The ingestion of very hot or very cold food or drink in health has a damaging effect, which is increased just in proportion to the rapidity with which the hot or cold substance is taken. Hence the gulping down of ice water or hot coffee, &c., means eventually, according to the light we are quoting, a mere ventral damnation. If a person takes a drink for the purpose of warming himself, as in cold weather, he can accomplish this by having the drink at a temperature of 116 degs. to 120 degs. F.

4. The use of very hot and cold substances, following or alternating, is injurious to the teeth. But the taking of cold water lessens the injurious action of extremely hot substances upon the stomach.

5. Ingestion of cold food and drinks lessens the bodily temperature, whether it be normal or febrile.

6. Cold fluids lessen the irritability of the stomach.

Cold ingesta raise the tone of the stomach, increase peristalsis, and promote movement of the bowels. Cold food and drinks increase the tendency to cough, according to Uffelmann, by causing reflexly a congestion of the bronchial vessels. Hence, persons with bronchial disease ought not to indulge in cold drinks. It is, however, a common custom to give persons who suffer from pulmonary hæmorrhage ice to swallow; and, according to the view stated, this would be an injurious practice.

Hot food and drinks stimulate the stomach more than cold. But after repeated use they lessen the tone of the digestive tract, and cause congestion and dyspepsia. This condition has been observed after the so-called hot water cure. Hot drinks tend to lessen bronchial irritation, and this is one cause, possibly, of the success in some cases of the hot water treatment of consumption.

“How’s your grandfather, Herbert?” “Not very well these days.” “Anything serious the matter?” “We fear so, grandfather has taken to smoking cigarettes.”

Popular Science Papers

“Blessings on Science! When the Earth seemed old,
When Faith grew dotting, and our reason cold,
’Twas she discovered that the world was young,
And taught a language to its lisping tongue.”

—Charles Mackay.

WHAT SHALL THE PUBLIC SCHOOLS TEACH?

By DR. AUSTIN FLINT.

(Concluded.)

As far as I can ascertain, physical culture in public schools does not exist, except in the form of so-called calisthenic exercises for girls, which do not involve enough muscular exertion to be of any sensible benefit. There is no provision whatsoever for boys. If I be correct in my estimate of the importance of physical culture, the only questions to consider are those of expense and practicability. Aside from the question of expense, the provisions for proper physical culture are simply a suitable room and ground, a single hour after the ordinary school exercises are completed, and competent direction and instruction.

The hour may be taken from the ordinary course of instruction, or an additional hour might well be given. The room and grounds—a room for inclement weather—and properly-selected gymnastic apparatus are a mere question of expense; but the most important and difficult part of the problem is the selection of competent teachers. To organize a system of physical culture on a proper scale, there should be an efficient superintendent of this department for all the schools, under whose direction the apparatus should be constructed and kept in order. Competent instructors should be appointed, one for each school, and under his direction all pupils should be compelled to take proper exercise, at least three times in the week, for one hour after the close of the ordinary school sessions in the afternoon. A male instructor could very well conduct both the boys’ and the girls’ classes, and two hours in the week would be sufficient for girls. This definite suggestion is made after a not inconsiderable experience in gymnastics.

The subject of manual training in public schools is now engaging public attention, and may very well be considered in connection with what has been said with regard to physical culture. Early physical culture would serve as a natural preparation for manual training as well as a useful addition to the system.

It is recognized by nearly all writers on this subject that to teach a trade is not one of the legitimate objects of education in public schools. This is clearly set forth in a recent article on “Manual Training in School Education,” by Sir Philip Magnus, who says that “the object of workshop practice, as a part of general education, is not to teach a boy a trade, but to develop his

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A complete refutation of quackery of all kinds, and a safe and reliable guide, from the medical standpoint, to all young men. Every youth should read this pamphlet as a guide to the safe conduct of life in a moral and physical sense. Full directions for the treatment of Nervous Debility so-called, and allied ailments, are also given. Thousands of sufferers have welcomed this pamphlet as a veritable beacon-light to health and purity of life.

faculties and to give him manual skill." It is no more within the province of an elementary public school to teach the trades than to prepare boys for the professions, although an exception may be made in favour of schools for the training of teachers. With this reservation, there can be no doubt with regard to the wisdom of establishing workshops in our public schools. This is by no means an untried experiment. In Great Britain, France, Austria, Belgium, Holland, and Sweden the system has been thoroughly tried, and the results have been most satisfactory. If the experiment should fail in our public schools, the causes of failure should be looked for in defects either in the plan or in the efficiency of its execution. With plans already formulated and the experiment certain to be made at an early date, it would be out of place here to discuss details.

The most important use of the public schools, aside from the acquisition of a certain amount of knowledge, is in the general influence exerted upon the mind and character of pupils. Personal cleanliness, habits of obedience and punctuality, honesty, and a proper sense of personal honour, are as important as knowledge acquired from books. A proper comprehension and use of the English language, with kindness and courtesy of demeanour, contribute much to success in life. Brutality in school discipline belongs, happily, to the past; and civility and gentleness are not now regarded by any class as unmanly. A boy may be taught to be a true gentleman in his own sphere in life, however humble that sphere may be.

Leaving for others a discussion of questions relating to general education, an interesting and important subject relates to elementary scientific instruction. To what extent is it desirable to teach the elements of chemistry, physics, and human physiology? It is beginning to dawn upon the minds of men interested in the higher education that actual knowledge has made great, not to say enormous, progress within the last century, and that what an educated man must know at the present day is not to be measured by the standard of a liberal education of a hundred years ago. We cannot now afford to spend

much time in pure mental training by studies that do not convey a fair proportion of practical and useful information. The evils of a too close adherence to antiquated methods of education are shown in the distress of a large class of educated persons unemployed. To a great extent the very elaborate education obtained at some of our universities fits men only for elegant idleness, and the class of men of leisure in our own country is not large and does not command much respect.

Men and women who would be quite unwilling to be regarded as imperfectly educated, frequently present a dense and impenetrable ignorance on all matters relating to science. In time this condition of things will undoubtedly be remedied, and perhaps the traditional elements of a liberal education will be unduly neglected; but now we should begin to emancipate ourselves from antiquated habits of thought and mental training. When it is remembered that Galileo lived only about three hundred years ago, that the discovery of the circulation of the blood was published in 1628, and that Lavoisier first applied accurate methods to the study of chemistry only in the latter part of the last century, it is evident that the sum of positive knowledge was comparatively small when the models of our present system of higher education came into existence. The best place to begin our reform in education is at the beginning; and now that something positive and definite may be taught with regard to the sciences, it is well that these subjects should be taught as early as they can be properly understood.

The philosophy of chemistry and the elements of physics are not difficult subjects. They are much easier of comprehension than the construction of the Latin and Greek languages, and they have the advantage, not alone of being elements of actual knowledge, but of indicating the methods by which scientific minds have arrived at truth. While a study of the ancient languages is useful and aids in the elegant expression of thought, a study of the sciences trains the mind to proper methods of thought. More of useful logic is learned from a study of experimental science and the reasoning from facts observed than from the so-called principles laid down in text-books; and scientific language, in its best form, expresses ideas in the fewest words and in the clearest construction.

The question of teaching anatomy and physiology in public schools is one which hardly admits of discussion, provided these subjects can be taught efficiently. This can be done by good teachers and with good books; but, unfortunately, good teachers of these subjects are few, and many of the text-books in common use are full of errors and faults. The errors of statement, however, are not so serious as the faults in style. The amount of anatomy and physiology that it is desirable to teach, even to the higher classes in public schools, is not great, and it is an error to imagine that these subjects are necessarily encumbered with technical names and expressions. All the anatomy that is required is simply what is sufficient to enable pupils to comprehend physiology. The fault that I find with many school-books is that the authors attempt to go too far. If pupils be taught the general mechanism of bones and joints, the actions of the most important sets of muscles, the general arrangement of the brain and nerves, the general characters of the blood and the mechanism of the circulation, the theory and mechanism of respiration, the characters of food, and certain simple facts with regard to the action of the digestive fluids, absorption, and the general action of glands, with simple explanations of the senses of taste, smell, sight, and hearing, they will know

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enough of anatomy and physiology for all practical purposes. Brief statements embodying the essential facts involved could be made in hardly more space than is occupied by this article; and a competent instructor, with the aid of a blackboard and coloured chalks, and with very moderate skill in drawing, could teach these subjects very easily. According to my observation, however, anatomy and physiology are not taught efficiently in schools, partly for the reason that the text-books treat these subjects too elaborately, and partly because there are no teachers specially trained for that kind of instruction. The simple laws of hygiene, of course, follow naturally upon physiology.

If anatomy and physiology are to be taught in public schools, and if the efficiency of instruction depends so largely on the instructors, who is to teach the teachers? It is difficult to answer this question. The courses on anatomy and physiology in medical colleges are not adapted to this purpose. Medical students are taught in what is practically a new language, and the most intelligent school-teacher, were he to attempt to learn in a medical college how to teach anatomy and physiology to his pupils, would be infinitely embarrassed in selecting his subjects and eliminating what is unnecessary. It is a most difficult thing to popularize science. Professional men hardly know how little, and laymen how much, it is desirable to teach. Popular physiology is not by any means a simple translation of technical terms into ordinary language; it is the clear and simple expression of facts in the science that should be a part of the knowledge of educated persons, in terms that are readily comprehensible by the people. Every one knows that he moves, breathes, feels, sees, hears, tastes, and smells, and that certain other important functions are carried on in the body. A knowledge of how these functions are accomplished should be a part of a fair education. An annual short course of lectures to teachers, in which not only the subjects should be taught but the best methods of teaching illustrated, would be most useful; and some such method of training teachers must be adopted before instruction in anatomy, physiology, and hygiene, and on the course to be pursued in ordinary emergencies, can take its proper place in the curriculum of public schools.

—*The Forum.*

HEALTH SCIENCE AND NEIGHBOURLINESS.—A heathen poet said: "I am a man, and nothing that concerns man is without interest to me;" and surely, if this was truly felt by a heathen nearly two hundred years before the birth of Christ, we who live nearly two thousand years after that divine expression of sympathy for man, must adopt the words with a fuller, richer meaning. You have experienced the change which passes over our relations to a man as we come to know something about him. We see him day by day taking his place opposite us at the desk, or his seat beside us in the pew, or we meet him from time to time in the tramcar, or pass him as we walk to business at a certain corner of a street. Bit by bit we come to know where he lives, what he does, what his social circumstances are. The man ceases to be a pale abstraction, and in short, becomes to us really a man. I cannot, in the same sense, make you to know the men and women of Glasgow. I can only build up in your minds, by the aid of a few figures and general facts, some notion of the physical circumstances of an impersonal average inhabitant. When we think of a citizen of Rome or of Athens, we have before us the outlines of a being whose home life and occupation and amusements and general surroundings we could describe.

—*Dr. Russell.*

Public Health

"Health is the first Wealth."—*Emerson.*

GERMS AND DISEASE.

By O. W. PECK, M.D.

Health Officer of Oneonta, N. Y.

HAVING to deal with an outbreak of diphtheria during the past year, I became interested in the subject of germs.

The further I pursued the subject, the more interesting I found it, and believing that something not only of interest but of profit might be present to my brethren of the Otsego County Medical Society upon this subject, which is so attractive and yet upon which the average practitioner is—I say it respectfully—so ignorant, I decided to select as the subject of my address not what is unknown but what is *known* about germs. Not by any means *all* or even the tithe of what is known, but some things that are known about them, not touching upon the hypothetical, however great the probabilities may be of the truthfulness of the conjectures.

At the time of our graduation, thirty years ago, what is now known as the germ theory of disease was, to all intents and purposes, unknown. It had been surmised that certain minute animals or bodies, invisible to the naked eye, were sometimes the cause of disease. Such guesses or assertions, based upon negative reasoning, were made and reiterated in various ways, and found more or less favour all the way along from the time of Terentius Varro, a Latin scholar, who wrote, it is said, a century before Christ, until the time of Pasteur, who first *demonstrated* the truthfulness of that which had been blindly discussed and believed or disbelieved in, as the case might be. Of course, the microscope, long waited for, revealed to the diligent searcher that which had previously been hidden, and brave men entered into the mysteries revealed and patiently investigated and sought light where before all had been darkness, or at best but dim twilight. They entered in, many of them, with the same sublime confidence in ultimate success that possessed Columbus as he stood upon the prow of the "Pinta" as she set sail for the boundless and unknown West.

Thirty years! What is now known? It is known that germs exist everywhere. That the air is loaded with them. Not all or many of them are disease-producing. That each produces its kind and *only* its kind. That the full development of the germ requires that the parent germ be perfectly developed and be planted upon a proper soil. Sow wheat, and you get wheat, never oats. Sow the germ of diphtheria, and you get diphtheria, and not small-pox. Sow wheat in the sand, and it will not germinate, or but imperfectly. Inhale the germs of diphtheria, and unless a lodgement is effected upon a surface adapted to receive it, it will not multiply. Sow an imperfectly developed germ of wheat, a grain harvested before it is ripe, and even under favourable conditions it will develop but imperfectly, if at all.

The same may be said of germs, disease-producing or otherwise. Not only are the effects produced by germs of a definite character governed by fixed laws, but, as would naturally be supposed, the germs themselves bear certain individual or physical characteristics, and labourers in this field have a well-defined, intelligible, and expressive nomenclature. A germ is a *seed*, as its name implies, yet a micrococcus and a bacteria have as

distinct or quite as diverse characteristics as a sweet pea and poppy-seed. Dr. John S. Billings has given the name of microderms, or little living things, to the great variety of microscopic particles found in air and water under ordinary conditions. Under this term, microderms, are included microphites, or little vegetable organisms, the microzoa, or minute animals, the microzymes, or little ferments, the microbes, little lives, or microbia of Pasteur, the bacteria, &c. The minutest spherical forms of the microderms are known as micrococcus, or little grains, the short cylinders or rods, bacteria, &c. These organisms can be and are cultivated, and spherical forms produce spherical forms, and rods produce rods.

It is not worth our while to set forth the arguments pro and con that were formerly used by the advocates and opponents of what was and is known as the germ theory. It is enough to say that within the last decade the labours of Cohn, Virchow, and Koch in Germany, Burdon-Sanderson and Tyndall in England, and Pasteur in France, have gone far to confirm not only the profession but the laity of the truthfulness of the germ theory. It was maintained, is now by some, we presume, that, given heat, moisture, and filth in proper proportions, disease would spring into activity *de novo*—that is, by a kind of spontaneous generation. The labours of the trained observers mentioned go to show that the factors heat, moisture, and filth furnish the conditions or environment, so to speak, that is adapted to the development of the disease-producing germs, yet no germ, no disease. A study of the germ theory is so interesting from every point, and such wonderful advances have been made in its development, that it is not an easy matter to decide where to leave it, what to say and what to leave unsaid. It would be interesting to trace its history from before the Christian era up to the present time.

Slowly and with long intervals of rest, the small procession marched, its pace much quickened with the advent of the microscope, while its numbers were augmented, until during the last decade the advance of the army, in numbers, has been so rapid that few of us have been able to keep pace with it. It is quite probable that those who boldly say, "We do not believe in this germ theory and this attenuation of Koch's and Pasteur's," disbelieve simply because they are ignorant of it, and it is no evidence of the untruthfulness of the doctrine that the busy practitioner of medicine cannot always trace disease to its cause. That part of this subject relating to attenuations and inoculations is full of absorbing interest, but time and space forbid my telling what is known about it. I will, only for our profit, undertake, in the language of another, to study the development of one germ, and, perhaps, if this paper is not too long and your patience not exhausted, relate some interesting facts that have been brought out in the study of germs and the practical results obtained.

It may, perhaps, be well at this point, to give the definition of the germ theory of disease, which is, "that certain diseases are due to the propagation in the system of minute organisms which have no share or part in its normal economy." The germs set up an action in the blood analogous to processes of fermentation that can be witnessed outside the body. As illustrative of the theory of the development of the germ, I will, as I have said, use the language of another: "Take a portion of any vegetable—e.g., the beet or some grapes—crush them, add a little water, let the mixture stand a short time, then pour off the liquid, and you have the simplest form of vegetable infusion. Allow it to remain exposed to the air at the ordinary temperature, and

shortly a change will be found to have passed over it, which is popularly called souring, but which is fermentation, and takes place as follows: the air is full of microscopic 'germs' or 'spores' or 'cells,' the microderms of Billings, which only need the right soil or matrix to grow or develop. Let a grain of corn remain in your coat pocket, and it will stay a grain of corn, but drop it in some fertile spot of earth, and it changes into a tall plumed spike, bearing many thousands of similar grains. The glucose of the infusion is related to these universally diffused spores just as the waiting earth is to the grain of corn, and a spore which might have stayed a spore a thousand years but for the infusion, finds its divinely appointed environment, lives its life, dies its death, and fulfils its mysterious but appointed part in the economy of nature. It is so small that it takes more than 3,000 of them ranged in line to measure an inch. One spore having appropriated its infinitesimal morsel of glucose instantly becomes two; these in turn appropriate their modicum of glucose and at once double, so that by a swift progression the nature of the infusion is changed—it may be into alcohol, it may be into something with boundless powers for mischief to which science has not yet fitted a name.

"The same thing is illustrated by allowing a little beef's blood to stand exposed to the air. An analogous change to the foregoing takes place, which is called putrefaction. In this case the albumen of the blood represents the soil. The germ that changes the fluid is bacteria. As has been remarked, the air is at all times laden with these spores, yet only when the proper conditions obtain, as illustrated by the kernel of corn, will they multiply. Of course these germs are constantly coming in contact with all substances, yet only when the predestined ones are brought together will there be development. Leave a pot of flour paste open, and it will become covered with a *greenish* mould; an old boot left in a damp place with *blue* mould, and a lilac leaf in July will have spots that look like dust from the road.

All of these—the mould—are plants produced by air-sown invisible seeds, and if not disturbed and the conditions remain favourable, will produce perfect plants and will ripen their seeds just as perfectly as any plant in the field or garden. This is not an imaginary statement, for the process can be watched under the microscope. These parasites are as dissimilar in their physical characteristics as any familiar forms of vegetation visible to the naked eye, as a potato plant and cabbage, if you please.

From the foregoing an idea can be obtained as to how germicides and disinfectants produce their good results—how they *kill* the germs. (All disinfectants are not germicides.)

Space forbids even an enumeration of them—it is a subject by itself. I desire just as briefly as possible to place before you what perhaps many of you may know, some of the real practical results, we might say *commercial* results, of the patient study of germs. Two diseases which are common to men and animals, both in the highest degree contagious and fatal in their unmodified forms, will illustrate the value of these latter-day discoveries; we refer to small-pox and splenic fever. All are familiar with vaccination and its results. Pasteur has done for animals what Jenner did for mankind. The money lost to France from the latter disease has amounted to 4,000,000 dols. annually. In every country of Europe it has been more or less of a scourge—528 men died of the disease in a single province in Russia in three years. Now the disease has lost its terrors through the introduc-

The Gamekeeper's Story.

THERE are very few men in England who are naturally more hearty and healthy than James Braddock. He is a gamekeeper, and lives at Jepson's Clough, Adlington, near Macclesfield. He is stoutly built, and until two years ago we may say he never had a week's illness in the whole sixty years of his life. One day, during the summer of 1887, he was found at home, and in the course of the talk that sprang up, Braddock told the following story, which we print because it will interest many besides himself.

He said: "Perhaps you have already heard about my case, and, if so, it's no use my telling it all over again."

"I heard it alluded to in Manchester," was the answer, "but I should like to hear it from your own lips."

"Well, sir," said James, "I'll run it over for you. I've told it lots of times, and it's always done good to somebody. It was two years ago this summer that I was taken very bad with indigestion. How ill I was, and how I finally got cured, is no news to the people in this part of the country, sir. Scores of them came from far and near to see me and talk to me about it. I first noticed a dull feeling all over me, and my appetite failed so I could eat nothing without just forcing it down, sir; and then it lay like a heavy weight on my stomach. Food used to make me feel strong for work and exercise, but now it seemed to do me no good at all. My mouth tasted bad, and when I looked in the glass I saw my skin and eyes had a yellow colour, and people said I was dreadfully bilious, my liver was out of order, and my blood all full of poison. And so I believed, for my head ached and my legs and arms ached, as though I had some manner of fever hold of me. I took pills, and a hundred other medicines, but they only made me feel a little easier for a day or two, and then I was worse than ever.

"After a bit, sir, I began to be short of breath, you know, and had to sit down and rest, when once I could walk all day without being tired or once fetching a long breath. I couldn't make out what was the matter with me or whatever had brought it on, but I kept on getting worse, and that much I was sure of. My heart would flutter and get weak and faint in my breast, and

that frightened me more than the stomach trouble, for I didn't know then that the indigestion and dyspepsia were really the cause of it all, sir. People kept telling me I had the heart disease, and was likely to fall down dead any minute. You may fancy how this took all the courage out of me, and I thought my work was done in this world. So it went on, sir, and neither my friends nor the doctors appeared to understand what was ailing me.

"One day I was taken with such a queer spell; it almost scares me to think back to it. I couldn't get my breath. I was choked as though a strong man had me by the throat, and I was sure I was going to die. The people fanned me and gave me whisky, and after a while I came out of it, weak as a cat, sir, and all in a cold sweat.

"But my stomach got worse afterward, and I was afraid the choking might come back, and the next time it would certainly kill me. It was about this time, one day, I picked up a North Cheshire newspaper and read of a case like mine being cured by Mother Seigel's Curative Syrup. I thought half-a-crown would na' break me, and I bought a bottle. The first few doses did me good, sir. You wouldn't 'a' believed it, neither would I, but it did. In a few days, maybe two weeks, sir, my stomach began to act, and my victuals stopped on it, and my strength begun to come back."

"You had no more choking, then?" said the visitor.

"No, sir, not after that. The fluttering of the heart troubled me no more, and the yellow went out of my eyes and skin; and, to put it short, sir, after taking two bottles of Mother Seigel's Syrup, I got as well as I ever was in my life. What this medicine is made of I don't know, but I'm sure that it's not like anything else. If I hadn't seen that account of it in the paper, and been led to use it, as certain as I talk to you now, sir, I believe I should have been under the sod months and months ago. I tell about it to everybody, and will do so as long as I have a tongue in my head, sir."

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tion of the attenuated virus of Pasteur. Fifty healthy sheep were placed at the disposal of Pasteur; twenty-five of them he vaccinated with his attenuated virus. All recovered. A fortnight later the entire fifty were inoculated with the "most virulent splenic fever virus."

The twenty-five that had been vaccinated with the attenuated virus were not affected, the other twenty-five died. It is said that dust taken from pits where sheep dying of the fever were buried twelve years before, produced by inoculation the disease in its most virulent forms. Pasteur discovered the spores in the casts of earth-worms, and thinks they may be brought to the surface in that way. It is related that Baron Seebach, of Saxony, was a great sufferer by repeated attacks of splenic fever in his flocks. He observed one day that clover was growing in great luxuriance in a corner of a field where, two years before, a sheep dying of the disease had been buried. He afterwards noticed that someone had stolen the clover. The next day a tenant lost a goat and had a sick cow, and acknowledged the theft of the clover.

The steps in the study of splenic fever, by which so much of practical value has been learned, it is interesting to trace. In 1850, Davaine and Rayer noticed in the blood of animals which had died of splenic fever the rod-like bodies now known as bacteria. In 1861, Pasteur published a paper on the fermentation of butric acid, and described the microscopical organisms that provoked it. Davaine read it, and conceived the idea that splenic fever might be due to a similar fermentation in the blood of the living animals, produced by the same organisms. Subsequent studies proved such to be the fact. It was found that the rod-like organisms lost their vitality after a few weeks, which led Burdon-Sanderson, in 1874, to conclude that the virus existed in two forms, "fugitive" in the rods, and "latent" in some form not yet determined.

At this time, young Koch was studying the rod-like organisms; and he found that they could be successfully cultivated. The aqueous humour of the eye of an ox he found to be an excellent field in which to cultivate them. He placed a trifle of the liquid containing the transparent rods under the microscope, and watched for two hours before any change could be seen. At that time they began to lengthen, and at the end of four hours were from ten to twenty times their original length. At the end of a few hours they put out filaments hundreds of times the length of the original rods. The filaments lay lengthwise, and twisted and filled the whole field of the microscope, making, in short, a luxuriant growth. Had his observations been abandoned at this point, his observation would have been of little, if of any, practical value. Patiently continuing the watch, he saw, after a time, little dots appearing in them. These dots grew more and more distinct, until they could be seen, microscopic, ovoid bodies, lining the integument like peas in the pod. At last the integument fell to pieces, and the field of the microscope was filled with seeds or spores. Here, then, was the "latent" form of the virus as believed to exist but not demonstrated by Burdon-Sanderson.

Cohn, of Breslau, confirmed the discovery. Guinea-pigs and rabbits were inoculated with the seeds, and died of splenic fever within twenty-four hours afterward. So, then, it is shown that disease may be produced by the contagion direct or indirectly. It explains, too, how contagion clings to a locality, and how, under favouring circumstances and conditions, it springs into light. Apples may be propagated either by cuttings, grafts, or

from the seed. So with splenic fever, the disease may be contracted at once from the rods, or later, from the rods having gone to seed. The results are the same, but reached by different routes.

I know that much more could be said that would, I think, be instructive; yet time forbids my pursuing the subject farther. Enough has been said, however, to accomplish the purpose of this address or essay—to wit, to tell you *something*, at least, of what is known about germs.

POISONING BY MUSSELS.—A shipwright in Liverpool was taken some time ago to the Northern Hospital in an unconscious condition, and soon afterwards a fellow-workman was conveyed to that institution in a similar state. The symptoms were nearly identical in both cases, though somewhat less severe in the second. The first case succumbed. It transpired that the men had been tempted by the presence of some mussels clinging to the bottom of one of the flats in the dock to pick them off and eat them.

THE ESTIMATED POPULATION OF GLASGOW.—In his last report to the Health Committee, Dr. J. B. Russell says that he has just received from the City Assessor the return of inhabited houses within the municipality, as at June 1st last, from which he annually makes his estimate of the population. The number of inhabited houses was 114,863, which multiplied by 4.745 (the average number of inhabitants per house in 1881) gives 545,025 persons. Adding to this 6,410, the number of inmates in institutions, as ascertained by special census, Dr. Russell finds that the total population of Glasgow on June 1st, 1888, was 551,435. This, as compared with last year, shows an increase in houses of 1,515, and in population of 7,440 souls. This estimate of the total population exceeds that of the Registrar-General by 25,347, and would make a difference of fully 1 per 1,000 in the death-rate.

PLAGUE OF LOCUSTS.—This plague which has been devastating Algeria for some time is certainly the most terrible that has been known in the colony for many years. According to the scientific authorities the locust or "cricket," which is now spreading terror among agriculturists and cultivators is not the "*Acridium Peregrinum*," which ravaged the colony in 1866 and 1877, but a smaller and more redoubtable species of insect, which propagates itself with amazing rapidity, and continues its devastation for years. The Sirocco has hastened the hatching of the eggs of the locust, and the mischief is thus growing rapidly. The females lay from eighty to ninety eggs each. At Setiff the streets and walks have been invaded by the insects, who obscured the sun in their multitudes and left acres upon acres of desolation behind them in the country around. At Bou-Saada the natives have endeavoured to prove themselves equal to the occasion, and have gone out to the fields playing their "noubas" or national music. Their usual mode of operation against the "crickets," or locusts, is to dig a few big trenches in the soil, by the side of which are placed pieces of canvas covered with metal bands. When the trenches are filled with the enemy the canvas coverings are turned over, and the Arabs beat the locust with flails until they reduce them to pulp. All this is, however, something like keeping the tide out with a pitchfork, and up to the present time the Government has been unable to find any proper means of fighting the insect army. In 1866 and 1873 squadrons of cavalry were employed in beating down the locusts, but to little purpose.

Healthy Houses

"A happy home must be a healthy home."—*Anon.*

DAMP CELLARS.

THE most prominent causes of damp cellars, says a contemporary, are :

1. Dampness permeating the walls.
2. Dampness from saturated soil appearing below the walls.
3. Dampness from imperfect plumbing.
4. Moist ground air permeating cellar bottom, forced in by air pressure.

The first is an evidence of either poor workmanship and material or imperfect drainage. Should it be the former, and discovered in time, a compulsory removal of the work is the best remedy. A good wall (stone is here understood) should have every space completely filled. Small, flat stones make the best work when carefully bonded and fitted. Look out for walls showing nothing but large, flat stone on the outer faces, as such are often but dry concrete in the centre. If the work has progressed too far to allow the wall to be taken down, the remedy is a thorough coating of cement on the outside—from grade to footing—backed by a careful drainage of the immediate vicinity. Great care is necessary to keep the surface water from the building on all sides. It will not suffice to keep it five, ten, or twenty feet away, and then allow it to pool, as the ground will absorb it, and if the strata should happen to incline in the direction of the cellar, conduct the moisture to the wall, where although perhaps not appearing in drops on the surface, still keeping the joints damp enough to affect the atmosphere and cause the mortar to decay.

Good, clean, yellow clay, well puddled and rammed around the walls, is an excellent protection, and one that should never be omitted.

Frequently, in neighbourhoods thinly settled, where the sewage system is imperfect, or rather, not completed, the ground becomes water-logged, or so saturated with moisture as to cause any shallow excavation to collect water, and it will be noticed in such ground that after a rain all these depressions hold the water with great tenacity. In fact the soil seems unable to absorb any more.

Cellars sunk in such ground will be damp at the foot of the wall, the moisture extending out on the cellar floor, while any small knoll, caused by uneven excavation, may be perfectly dry on top, and even, as has occurred in my practice, the clay opening in seams from contraction in drying, while but a few feet away the mud was three to six inches deep. This has been noticed even in a house situated on a small plateau with rapid drainage to all sides.

A SHEET of spirit money, brown paper having a patch of gilding on one surface, is laid over the upturned face of a dead Chinaman, because it is said that, if the eyes are left uncovered, the corpse may count the rows of tiles in the roof, and that in such case the family could never build a more spacious domicile.

GARGLE FOR THROAT-CATARRH.—Dr. Endler highly recommends the following gargle in cases of catarrh of the pharynx or larynx. He says it is by no means unpleasant to the patient, and that its use has given him satisfactory results: Sulph. zinc, seventy-five grains; aq. menth. piper., two pints. S. To be used as a gargle only, three or four times a day.

Notings from the Journals

"Th' ingredients of health and long life are
Great temperance, open air,
Easy labour, little care."—*Sir Philip Sydney.*

Holiday Perils.—These casualties are mainly comprehended under three categories—namely, deaths while bathing, boating accidents, and misadventure upon the mountains. Bathing fatalities are due mainly to two causes—first, ignorance of the nature of the strand or coast on the part of the non-swimmer, who ventures incautiously out of his depth, or who is swept away by some unknown current; secondly, accidents to the swimmer in deep water while he is out of the reach of help. In the popular mind "cramp" is regarded, probably without sufficient reason, as the chief cause of these latter accidents. It is clear that the former class of casualty might be almost wholly avoided if bathing were forbidden except at authorized places, and if care were taken to forewarn the non-swimmer of any peculiarity in the conformation of the coast or the nature of the prevailing currents. It would hardly be too much to ask the municipalities of our leading watering-places to exercise a little more real control over the bathing, which forms one of their chief attractions; to instal an official, with more authority than the usual attendant, who might supervise the entire bathing arrangements, forbid bathing at dangerous places and unsuitable times, and be responsible for the efficiency of life-saving apparatus. As regards the second type of cases, we fear much mischief results from the common notion that all sudden accidents to the swimmer in deep water are due to "cramp." As a matter of fact, cramp, when it does occur, only incapacitates one limb, and need cause no fatality if help be reasonably near, provided the swimmer does not lose heart and give himself up. The cases, unhappily so numerous, in which the more or less accomplished swimmer is seen to struggle for a moment or two and then sink, are in all probability due usually to failure of the action of the heart. Such cases rarely occur, except where the swimmer has exhausted himself by long immersion, and often by vainglorious efforts to accomplish some unusual feat of natation. We need, then, to teach that *feeble circulation*, and not "tendency to cramp," is the great indication for caution in bathing, and that individuals thus affected cannot safely remain many minutes in the water, or essay any lengthened efforts of swimming. It would be pedantry to lay down any rules regarding the precise time during which immersion may be safely enjoyed, or the length of swim that may be prudently attempted. Everything depends, of course, upon the individual; but the bather may safely take it for granted that if he remains immersed until numbness of the extremities or shivering has set in, or if he continues to swim until he feels marked muscular fatigue, he has exceeded the limits of prudence. When accidents of this class occur, everything evidently depends upon the prompt use of life-saving apparatus. It cannot be too urgently impressed upon the public mind that in such cases every moment is of priceless value. Instances now and again find their way into the papers of resuscitation from drowning after immersion had lasted twenty, thirty, or forty minutes; and the public, with its usual appetite for the marvellous, reads such cases, and gets a hazy idea that there is practically no limit to the time after which recovery from submersion is not at least possible. Such a belief is in every way lamentable. While we must grant that the time cannot be definitely fixed, and varies according to

age, sex, and the peculiar circumstances of the case, it should be emphatically taught that death from submersion generally ensues in *from four to five minutes*, and that after that period, while it is right to make persevering use of proper remedies, recovery cannot be confidently expected.—*Lancet*.

✦ School Training and Public Morals.—Complaint is often made that crime and pauperism—twin evils of society—remain prominent among us, and some disappointment is not unnaturally expressed that our system of national education has not done more to eradicate these evils. The medical man must always look upon human action as the outcome of action within the body, stimulated by present surroundings, or by those that acted upon the ancestors of the individual. Remedial measures for the correction of defects in the constitution of the individual, whether these be inherited or due to the impress of circumstances, should be applied early, while the brain is growing and developing, and its spontaneous action is still capable of easy control from without. We look to the school-teachers as those who have power to do much for the improvement of the brains and brain-action of the rising generation by wise training and wholesome discipline. Children, as a rule, present much spontaneous action of brain, and this needs to be cultivated and trained into mental action and good behaviour in harmony with the surroundings. The child's brain-action is controlled in the school by the teacher's looks and words, as well as by the sight of the black-board and the books. When conduct is exceptionally different from what it should be, and cannot be thus easily controlled, it is the imperative duty of the teacher to use other means of discipline, and employ corporal punishment if necessary. There are, however, exceptional cases. All children are not cast in the same mould; and it is these exceptional children—whose inherited condition or whose brain-state as induced by circumstances are exceptionally difficult to control—who need the teacher's eye constantly upon them, and therefore require exceptional methods of education. There is strong reason to suspect that among these exceptional children we have many of those whose conduct, both while in school and when they leave it, induces many people to look upon national education as a failure in preventing ruffianism and defective social morality.—*British Medical Journal*.

✦ Animals and Earthquakes.—In the last issue of the Transactions of the Seismological Society of Japan, Prof. Milne discusses the effects of earthquakes on animals. The records of most great earthquakes refer to the consternation of dogs, horses, cattle, and other domestic animals. Fish also are frequently affected. In the London earthquake of 1749, roach and other fish in a canal showed evident signs of confusion and fright; and sometimes after an earthquake fish rise to the surface dead and dying. During the Tokio earthquake of 1880, cats inside a house ran about trying to escape, foxes barked, and horses tried to kick down the boards confining them to their stables. There can, therefore, be no doubt that animals know something unusual and terrifying is taking place. More interesting than these are the observations showing that animals are agitated just before an earthquake. Ponies have been known to prance about their stalls, pheasants to scream, and frogs to cease croaking suddenly a little time before a shock, as if aware of its coming. The Japanese say that moles show their agitation by burrowing. Geese, pigs, and dogs appear more sensitive in this respect than other animals. After the great Calabrian earthquake it is said that the

neighing of a horse, the braying of an ass, or the cackle of a goose was sufficient to cause the inhabitants to fly from their houses in expectation of a shock. Many birds are said to show their uneasiness before an earthquake by hiding their heads under their wings, and behaving in an unusual manner. At the time of the Calabrian shock little fish like sand-eels (*Cirricelli*), which are usually buried in the sand, came to the top and were caught in multitudes. In South America certain quadrupeds, such as dogs, cats, and jerboas, are believed by the people to give warning of coming danger by their restlessness; sometimes immense flocks of sea-birds fly inland before an earthquake, as if alarmed by the commencement of some sub-oceanic disturbance. Before the shock of 1835 in Chili all the dogs are said to have escaped from the city of Talcahuano. The explanation offered by Prof. Milne of this apparent prescience is that some animals are sensitive to the small tremors which precede nearly all earthquakes. He has himself felt them some seconds before the actual earthquake came. The alarm of intelligent animals would then be the result of their own experience, which has taught them that small tremors are premonitory of movements more alarming. Signs of alarm days before an earthquake are probably accidental; but sometimes in volcanic districts gases have emanated from the ground prior to earthquakes, and have poisoned animals. In one case large numbers of fish were killed in this way in the Tiber, and at Follonica, on the morning of April 6, 1874, "the streets and roads were covered with dead rats and mice. In fact it seemed as if it had rained rats. The only explanation of the phenomenon was that these animals had been destroyed by emanations of carbon dioxide."—*Nature*.

CONTAGION IN LAUNDRIES.—Dr. Russell, Medical Officer of Glasgow, says that during the last ten years over a million articles (from persons affected with every kind of contagion known in this country) have passed through the Glasgow laundry, and that he has never known a case of interchanged disease, although the women engaged in the laundry have occasionally suffered from handling the linen before the boiling process.

OIL OF OLIVES.—Olives are principally imported into this country from France and Spain. The oil is the lightest of the fixed oils when pure, and derived wholly from the fruit. The growth of the olive and the manufacturing of the oil affords considerable employment to many of the inhabitants of France and Italy. The time of the olive-harvest is in November and December. The quality of the oil greatly depends upon the gathering of the fruit in the first stage of maturity; it should be carefully plucked by the hand, and the whole harvest completed, if possible, in one day. The olive-mill is simple—the fruit is reduced to pulp, put into bags of coarse linen or feather-grass, and then subjected to pressure. The oil first expressed, being the finest, is termed virgin oil. A second, and afterwards a third, quality of oil is obtained by moistening the residuum, and repeating the pressure. The Tuscans were the first who exported olive oil to any extent, and thus in Europe it is largely known as Florence oil, but the finest and purest virgin oil is said to be obtained from Aix, in France. The varieties of olives are nearly as numerous as those of the grape or fig, the French alone describe between thirty and forty sorts. The inhabitants of the South of Europe use olive oil for the same purposes as we use butter, and feel at least as much dislike to the product of the dairy as we may feel for the use of oil. In this country it is scarcely eaten, except with salads or for culinary purposes.

COMMENCEMENT OF A NEW VOLUME
ON FRIDAY, OCTOBER 5th.

IMPORTANT ANNOUNCEMENT.

BONUSES TO SUBSCRIBERS TO "HEALTH."

HEALTH, as our readers are aware, may be obtained of all Booksellers and Newsagents, and at the Railway Book-stalls, on the day of publication. It may also be ordered from the PUBLISHER, 2, Paternoster-square, London, E.C., who will send the journal, post free, for a year, on receipt of postal orders for 10s. 10d.

As many of our readers who live in remote districts prefer to obtain HEALTH from the Publisher direct, and as we are desirous of increasing the already large number of subscribers who give us a yearly order for the journal, we offer the following FREE GIFTS and BONUSES to all who subscribe to HEALTH for one year or longer:—

(1.) To each Subscriber who remits 10s. 10d. to the Publisher, entitling him (or her) to receive one copy of HEALTH, post free, for one year, we shall present a copy of Dr. Andrew Wilson's work, entitled "A Manual of Health Science" (Longmans & Co.), value 2s. 6d.

(2.) To each subscriber who remits 21s. 8d., entitling him or her to receive two copies of HEALTH weekly, post free, for one year (or one copy for two years), we will present Dr. Richardson's "Ministry of Health" (Chatto & Windus), value 6s. The copies of HEALTH so ordered may be posted to separate addresses.

(3.) To each person who subscribes 32s. 6d., for three copies of HEALTH, post free, weekly, for one year, we will present the volume by Dr. Richardson mentioned above, and also the handsome, illustrated book entitled, "Studies in Life and Sense," by Dr. Andrew Wilson (Chatto & Windus), value 6s.—being a free gift of the total value of 12s.

The bonus last mentioned will also be presented to anyone who succeeds in obtaining three yearly subscribers to HEALTH, and who remits to the Publisher the sum of 32s. 6d., together with the names and addresses of the persons to whom the copies are to be posted each week.

As the literary gifts above-mentioned constitute books containing solid and reliable information regarding health and other matters of popular scientific interest, it will be seen that the above scheme, while intended to increase our already large circulation, also offers distinct advantages to new subscribers who guarantee by their subscriptions a year's support to this journal. All communications regarding subscriptions and other purely business details connected with HEALTH should be addressed directly to the PUBLISHER, 2, Paternoster-square, London, E.C., and not to the Editor.

Our Letter-Box

"Conference [maketh] a ready man."—Bacon.

NOTICES TO CORRESPONDENTS.

All Communications for the Editorial Department (including Books for Review, Specimens of Sanitary Appliances, &c.), to be addressed to "THE EDITOR OF HEALTH," 2, PATERNOSTER-SQUARE, LONDON, E.C. Those intended for the Publishing Office to be sent to MR. A. P. WATT, THE PUBLISHER, at the same address.

"ELECTRICITY IS LIFE."
(TRADE MARK.)

PULVERMACHER'S
WORLD-FAMED
GALVANIC BELTS,

FOR the CURE of NERVOUS DISEASES.

HAVE RECEIVED TESTIMONIALS from

THREE PHYSICIANS to

HER MAJESTY the QUEEN,

THE ACADEMIE DE MEDICINE of Paris and

FORTY MEMBERS of the

ROYAL COLLEGE of PHYSICIANS of LONDON.

RECENT TESTIMONIALS.

GALVANISM v. SLEEPLESSNESS AND NERVOUS DEPRESSION.

Barnstaple, Devon, September 28th, 1888.
Dear Sir,—It is only fair to you to say that after wearing your combined Belt for a short time, I felt very much better, and now I am quite well. I am sure your treatment has done me more good than any medicines, and I strongly recommend anyone suffering from sleeplessness and nervous depression to give your Belt a trial.

Thanking you sincerely for your kindness, very truly yours,
Mr. J. L. Pulvermacher, 194, Regent-street, W. J. S. JONES

GALVANISM v. WEAK CHEST and GENERAL DEBILITY.

Belfast, 24th September, 1888.
Gentlemen,—Twelve months ago you supplied me with your special Combined Band for weakness of the chest. I wore it for six months, and the result has proved a complete success. I am very glad to be able to bear testimony to the efficacy of your appliance, my general health has greatly improved, and I feel stronger in every way. I cannot speak too highly of your treatment, and shall have much pleasure in recommending it to my friends.—Yours faithfully,
H. ROBERTS.

Messrs. Pulvermacher & Co., 194, Regent-street, W.

GALVANISM v. LOCAL DEBILITY.

Gibraltar, 20th September, 1888.
Gentlemen,—I purchased one of your Galvanic Appliances for nervous and local debility two months ago, and I am glad to be able to inform you that I have derived great benefit from its use.

Your treatment more than fully bears out all that you claim for it, and I shall be always very glad to strongly recommend your Belts to all who may be suffering from my complaint, as I have been afflicted for more than two years.—Yours truly,
J. ROYLE.

Messrs. Pulvermacher & Co., 194, Regent-street, W.

GALVANISM v. INDIGESTION AND NERVOUS DEBILITY.

Edgbaston, Birmingham, 16th Sept., 1888.
Dear Sir,—It is now about 10 years since I testified to the great efficacy of your appliances, and during the time I have continued to enjoy most excellent health, and am never troubled with indigestion, debility, and kindred ailments. I think it almost impossible for my health to be better.

To brain workers and nervous sufferers your appliances are most valuable, and I cannot too strongly recommend them.—Yours very truly,
J. L. Pulvermacher Esq., 194, Regent-street, W. W. ARTHUR.

GALVANISM v. NERVOUS EXHAUSTION.

Kingsworth, near Ashford, Kent, 4th September, 1888.
Dear Sir,—I have been wishing to write to you for some time to thank you for the great benefit my lady friend has derived from your treatment. Everyone notices the change in her, and she can now walk any distance with pleasure, and has life and energy.

We gladly express our joy and gratitude for the great benefit received, and are yours truly,
Messrs. Pulvermacher & Co., 194, Regent-street, W. M. HILLS.

GALVANISM and SLEEPLESSNESS and PAINS in the LEGS.

Caterham, Surrey, August 9, 1888.
Sir,—I have much pleasure in sending you word that your Galvanic Belt has quite removed the severe pains in my legs which I suffered from, and I can now sleep well at night. My bladder is much stronger, and I am better in every way, and I consider your treatment the greatest blessing. I shall recommend your Belts to every one.—Yours faithfully,
J. L. Pulvermacher, Esq., 194, Regent-street, W. JOHN SCANLON.

GALVANISM v. RHEUMATISM.

39, Lincolns-street, Southport, August 4th, 1888.
Gentlemen,—In May last I purchased a Galvanic Belt from you for Rheumatism, and after wearing it for three days, to my astonishment I could point my foot and walk with it, and now I can walk a couple of miles and can get both my hands over my head.

I am in my seventieth year, and before I used your Belt I had great difficulty in walking across the room, and could only just get my right hand to my mouth to feed myself, but I could not touch my lips with my left hand, and despair seemed to be getting fast hold of me.—Yours gratefully,
Messrs. J. L. Pulvermacher & Co., 194, Regent-street, W. D. CORDINGLEY.

GALVANISM v. NERVOUS EXHAUSTION.

The distressing symptoms of Nervous Exhaustion and Debility are speedily removed by means of PULVERMACHER'S world-famed GALVANIC BELTS, which are so arranged as to convey a powerful electric current direct to the affected parts, gradually stimulating and strengthening all the nerves and muscles, and speedily arresting all symptoms of waste and decay.

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QUERIES AND ANSWERS.

REPLIES: GENERAL, SANITARY, AND MEDICAL.

LIVERPOOL.—You should read Malthus in the original if you wish to gain some idea of his views. We do not know of any work which gives the particulars you desire, but any good bookseller in your city would be able to give you the names of works likely to be of service to you.

M. WYLIE.—You suffer from a form of piles. Guard against constipation by aid of the hints given to "Septimus" in HEALTH, No. 286, and apply to the piles a little Hazeline, which should be used as a lotion on lint. Bayley's cure for piles (17, Cockspur-street, Pall-mall, London, S.W.) should be tried by you if the above treatment does not suffice for a cure.

ENQUIRER.—We suggest that you should replace your tea by Van Houten's Cocoa, which is a true food, and as such, well adapted for your lack of stamina. In addition, you should take a teaspoonful of Syrup of the Hypophosphites in a wineglass of water, twice daily, after your meals.

B. T.—The effects you describe are merely due to a low state of your nervous system, and we recommend you to take the tonic ordered to "Enquirer" above, by way of bracing up your system. Let us hear from you if not bettered.

V. X. R.—Yes, by all means let us hear how you progress. The symptoms you name simply arise from some digestive disturbance, and need not cause you any anxiety. To cure them, take less flesh food, and drink freely of the Pitkeathly Water (advertised in our pages).

R. E. M.—You cannot expect your hair-troubles to be cured in a few weeks, and if, as you say, the lotion has done good, continue it for a time yet. Write again, after a few weeks' further trial of it.

OMEGA.—1. Fairchild's Powders are the best. Read the article in HEALTH, No. 286, on peptonizing milk. 2. The Digestive Tea is most excellent. 3. We have answered your question before: olive oil is the more readily digestible of the two. 4. The Cellular Clothing, certainly—the winter makes. 5. No: Dahl's Cakes are used for the cure of constipation, and they are likewise a food.

F. BROWN.—Press them out of the skin with the finger-nails, and thereafter sponge the skin with Bayley's Eau de Cologne. Take hot baths frequently, and avoid excess of fatty foods.

CRAIGO.—Under all the circumstances we should say let the patient undergo a thorough examination at the hands of an experienced physician. Send us stamped addressed envelope, and we will forward name of a reliable man in your city. A consultation of this kind will ease your mind, and save much worry; only the patient should not be so "thrwn" where health is concerned. You had better show her this latter remark, as a piece of sound advice.

FOUNDRY.—Follow the advice given to "Septimus" in HEALTH, No. 286; and if not bettered after giving it a fair trial, write again.

EAR DISEASE.—We can hardly understand your being treated in the way you describe. From your account it is evident there is suppurration of the middle ear. Your only wise course is to see a thoroughly competent aural surgeon in London, whose address we can send you on receipt of stamped addressed envelope. Such an affection is too near the brain to be trifled with, so have it seen to at once.

J. C. A.—Try Bayley's Cure for Piles (17, Cockspur-street, Pall-mall, London, S.W.), and use the ointment and tablets as directed on the medicines themselves. If we can be of further service to you let us know. The use of the Cascara Cordial or Tabloids and the diet-hints given to "Septimus" in HEALTH, No. 286, will aid you largely.

JOSEPH.—We know of no such contrivance as you desire, and can suggest none. What you name, however, need not trouble your mind at all. The matter is too common to cause comment. Read the pamphlet, "A Lecture to Young Men" (post free, for 1s. 1d., from Mr. Renshaw, 356, Strand, London, W.C.).

NEVER SAY DIE.—1 You require a stronger lotion. Try that recommended to "Peter Rowan" in HEALTH of last week. 2. Enlarged veins among the loose cellular tissue. Apply a little Lanoline Cold Cream to the parts each night.

INVALID.—All such enemas are barbarous and useless procedures. Read the article in HEALTH, No. 285, on glycerine as a cure for constipation, and use this substance as there prescribed. As to diet, take Dahl's Cakes (advertised in our pages) regularly to breakfast and tea, and note, also, advice given to "Septimus" in HEALTH, No. 286.

THOR.—Your question is fully answered in page 2 of HEALTH, No. 287—last week's number.

REPORTED DEAD.

A SINGULAR INCIDENT IN THE LIFE OF ONE OF OUR CITIZENS.

("Cork Daily Herald," October 2nd.)

To the Editor.—SIR,—To my many friends in all parts of Ireland, as well as other parts of the world, a short history of an incident in my life will, no doubt, prove interesting, and, I sincerely hope, profitable.

In 1883, while engaged as engineer of the s.s. "Evelyn," I first found that I was not a well man. I had severe pains in the small of my back; my head ached almost constantly, and I began to lose appetite and energy. When I had finished the voyage and returned to Cork, I called on one of the very best medical practitioners in the city, but as I found I was receiving no benefit I soon stopped his attendance. Gradually, but most surely, I grew worse, and was forced to call in another eminent surgeon, and one holding a high official and professional position. He gave me some medicine which made me much worse from the start, and caused blotches and pimples to break out over my face and body, and almost entirely destroyed my stomach. He thought my case a very serious one, and one likely to result fatally. By this time I had become very greatly weakened; could scarcely walk, weak pulse, furred tongue, bad taste in the mouth, appetite almost entirely gone, greatest difficulty in retaining the simplest kind of nourishment on the stomach, and the old pains in the head and back were increased threefold. At one moment I would be as cold as ice, and would get as close to the fire as possible, and the very next moment my skin would become hard and dry and every drop of my blood seemed like boiling water coursing through my veins. I called in, in succession, four other of the best and most successful medical men in Cork, and spent not less than one hundred pounds in advice and medicine, but could get no relief whatever. I was finally forced to take to my bed, and could not attend to any sort or kind of business, mental or otherwise. Every pain from which I had before suffered was increasing. My stomach, feet, and ankles became swollen and dropsical, my memory became treacherous, I had given up all hope of ever regaining health, and only awaited death. One day I picked up, quite accidentally, from the bed, where my little niece had left it, a book in which my case was most accurately described, and at the same time giving instances of such cases being cured by "Warner's SAFE Cure." Having lost all faith in the regular practitioners' methods of treating me, I decided to try it, and to that end at once procured a bottle, and then a second one, and by the time I had taken the second I felt that I had received some benefit. I wrote to Messrs. Warner & Co. in London, and from them got some advice about my diet, drink, and baths. I took the medicine honestly according to directions, and followed strictly the diet, as well as observed to the letter the advice received privately from the firm. I had wasted away until I only weighed 8 stone 1 lb., and in twenty-two days I weighed 8 stone 9 lbs., a gain of 8 lbs. in three weeks, and this was the very least part of my improvement in the same time, for my pains were rapidly leaving me, my appetite and digestion were improving, and the change generally was so radical that my friends and family were simply astounded. The improvement continued until I had taken more than thirty bottles of the "Warner's SAFE Cure," and found myself thoroughly and absolutely cured, and I thank God for the medicine, and for the fact that after five years of the most intense suffering I am to-day as strong and healthy as at any time in my life, and capable of doing any kind of work. I began taking the "Warner's SAFE Cure" in December last, and in less than six months it did more for me than six of our best medical men could do in 4½ years. I am glad to heartily recommend "Warner's SAFE Cure" to all sufferers from Kidney, Liver, or Bladder disease, and I give this testimonial out of gratitude for the benefit I have received from the medicine, and I hope its widespread publication may prove of benefit to others afflicted as I have been. At one time I was reported dead, and neighbours closed their shops out of respect for me.

Yours faithfully,
WM. MURPHY.

No. 1, George St., Cork,
Sept. 27th.

LES MISERABLES.—You will grow out of the nervous diffidence which is at the root of your troubles. Take plenty of fresh air and outdoor exercise, and try fifteen drops Fer Bravais, taken in water, twice daily, after your food.

C. PARK.—Give Pulvermacher's Belt a fair trial, by all means. It is a genuine appliance, and calculated to cure your ailment.

BALTIC.—We recommend you simply to take a dessertspoonful of Scott's Pure Cod Oil Emulsion with Hypophosphites after your meals. This is both a tonic and nutritive measure, likely to benefit you in the direction you name.

COMMONSENSE.—1. Consult Messrs. Krohne & Sesemann, Duke-street, Manchester-square, London, W., who will be able to adapt a simple appliance to your toe to reduce the deformity under which you labour. These deformities are only curable by mechanical means. 2. See and follow advice given to "Isabelle Chamberlain" in the last number of **HEALTH**. If not bettered, write again.

G. GIBBS.—Give the following hair lotion a fair trial:—Bay rum, two ounces; glycerine, two ounces; tincture of cantharides, one drachm; oil of bergamot, half a drachm; sulphate of quinine, ten grains; water, four ounces. Use this every morning, and rub it into the roots of the hair; all other oils and pomades being discarded. Use a soft brush only, and wash the hair once in a week or ten days, at night, with Bayley's Soap and tepid water. Keep the hair very short for a time.

A. KING.—Try washing the hands with Bayley's Soap and tepid water, and use thereafter a dusting-powder composed of powdered oxide of zinc, one ounce; powdered camphor, one drachm; and starch, two ounces. Mix. Label: "The Dusting-Powder, for external use only." Avoid damp and chills.

NETTA.—A stimulating hair-wash for cases of hair weakness is made as follows:—Aromatic acetic acid, one ounce; vinegar of cantharides, two ounces; spirits of rosemary, three drachms; glycerine, one drachm; rose water, to make up eight ounces. Mix. Label: "For the hair—Outward use only." Shake the bottle and sponge the roots of the hair with the wash each night. The wash, if found to be too strong for the scalp, is to be diluted with water.

L. F.—Mellin's Food is that suited for a child of the age you mention. If you give common foods you will injure the infant's health.

GORO.—You should understand that what you complain of, unless occurring too frequently, is a result of robust health, and not (as quacks will tell you) a source of disease. The firm you name is a well-known quack one; if you again submit to their "treatment," after your warning, you will certainly regret it.

No. 2.—Try the Vin Mariani (Roberts & Co, Chemists, New Bond Street, London, W.) as a suitable tonic. Use as directed on the bottle.

CERTUS.—For the offensive breath and flatulence, we recommend you to take the

following:—Carbonate of bismuth, ten grains; wood charcoal, ten grains; bicarbonate of soda, five grains. Mix. One such powder to be taken thrice daily, half an hour before meals.

D. F.—To unite iron with cod oil, the following is a method:—Syrup of the iodide of iron, three drachms; mucilage of acacia, one ounce; cod liver oil, to make up six ounces. Mix. A dessertspoonful may be given after food, twice or thrice daily.

A. P. R.—A hair lotion adapted to promote growth is made as follows:—Tincture of nux vomica, three drachms; distilled vinegar, two and a half ounces; tincture of capsicum, one drachm; tincture of cantharides, six drachms; spirit of rosemary, one ounce; rose water to make up six ounces. Rub a little into the roots of the hair each morning.

GENTIAN.—Try the following cooling lotion:—Goulard's Extract, half a drachm; spirits of wine, two drachms; water, eight ounces. Mix. Apply this to the boil constantly on lint.

GINGER.—Inhale, at bedtime, the vapour of a pint of hot water to which a teaspoonful of Friar's Balsam has been added. After your meals, take a dessertspoonful of Scott's Cod Oil Emulsion with Hypophosphites, thrice daily, as a general strengthening measure. If you have sufficient reaction, cold sponging to the chest will also be found useful each morning.

A. R.—Howie's Filter (Hurlford, Kilmarnock, N.B.) is one of the best and safest you can use. It is simple in construction and not liable to derangement.

AJAX.—Try bathing the face morning and night with light white wine—Hungarian will do; or use the following lotion:—Sulphate of zinc, two grains; compound tincture of lavender, eight minims; distilled water, one ounce. Apply two or three times daily.

NIPPER.—We have no faith in any such treatment as that you name. If you send us stamped addressed envelope, we will send you name of a specialist.

FALSTAFF.—Apply to the French Hygienic Society, 56, Conduit Street, W., and they will probably be able to supply you with a harmless hair dye such as you require.

G. H.—Clothe warmly, and take the following mixture: Chloride of ammonium, two drachms; spirits of chloroform, one drachm; simple syrup, three drachms; water, to make up six ounces. A table-spoonful to be taken in water every four hours.

E. GREEN.—The closet you have in use is of a very ancient type. You cannot expect to possess a healthy house with such an inlet for sewage gas. Replace it by one of Twyford's "Unitas" Closets (advertised in our pages), which is simple, cleanly, and not liable to get out of order.

P. A.—Lamplough's Pyretic Saline is certainly the best of the saline aperients in the market. Neither this nor any other aperient, however, is meant to be taken continually.

E. G. R.—Try taking twenty grains bromide of potash dissolved in a wineglass of water at bedtime for a few nights, and note effect of this drug on your symptoms. If not bettered, write again.

DAVID SIM.—Continue the plan of bathing the parts with tepid water, to which two or three parts of Hazeline (say to ten parts of water) have been added. Dust a little of Woolley's Sanitary Rose Powder on the parts after washing.

TALUS.—Read the pamphlet, "A Lecture to Young Men," post free for 1s. 1d. from Mr. Renshaw, 356, Strand, London, W.C.

J. FORD.—We only send addresses of medical men on receipt of stamped addressed envelope. Comply with this rule, and we shall be glad to advise you.

C. B.—Sit and rest with your feet elevated, so as to favour the return of the blood in the veins. Have the foot of your bed also elevated. Avoid constipation above all else, as this is a frequent cause of varicose veins, as also is long standing in business.

OXALIC.—The following mixture might be tried:—Carbonate of ammonia, one drachm; bicarbonate of potash, a drachm and a half; infusion of chiretta, six ounces. A table-spoonful thrice daily before food.

ARTISTE.—Apply to the face a little pure Lanoline, to which your chemist should add Powdered Calamine (Ver), in the proportion of one drachm to one ounce of Lanoline, thus making a thin paste, easy of application at night.

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